ENTOMOLOGICAL
SOCIETY OF
BRITISH COLUMBIA

PROCEEDINGS

OF THE

ENTOMOLOGICAL SOCIETY

OF

BRITISH COLUMBIA

(INCORPORATED)

1927

NUMBER TWENTY-FOUR

Printed by
Evans & Hastings, 576 Seymour Street, Vancouver, B.C.

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ENTOMOLOGICAL SOCIETY
of
BRITISH COLUMBIA

REPORT OF THE SECRETARY-TREASURER FOR THE YEAR 1925

I beg to submit the following report on the activities of the Society for the past year:

Finances

The financial state of the Society continues very satisfactory, owing, chiefly, to the annual grant from the Provincial Government.

Our total expenditure for the year was $286.35, and our income $304.05. Our balance to date in the bank is $194.25.

Proceedings

Number 22 of our proceedings was published during the past year at a cost of $187.00.

The year has again been a heavy one for applications for back numbers of our publications, and, when these were sent, in nearly every case exchanges were received, which have been incorporated in our library.

Membership

There are at present thirty-five members of the Society, a slight increase over last year.

Library

I have received from Mr. Downes two lists of the contents of our library, one covering systematic papers and one the economic matter.

The library is lodged with the Provincial Library in the Parliament buildings, and books are sent free to members upon application to the Provincial Librarian. The great drawback in the past has been the absence of a catalogue, and the list supplied by Mr. Downes is the result of a motion passed last year that Mr. Downes and Mr. Hardy be deputed to compile a list, so that it may be printed and distributed to members.

Advisory Board

A meeting of this board was held in December last, when the following subjects of policy were discussed:

A proposal from the B. C. Academy of Science for a joint annual meeting for all scientific bodies in the province was referred to this meeting for consideration.

On the question of adding books to the Society's library, the Secretary was asked to circularize the members and gather their opinions regarding the books most wanted, when it was suggested that $100.00 be expended on a selection of these.

The advisability of publishing check lists of the various orders of insects found in the Province was discussed, and the Secretary was again asked to circularize the members, asking what groups they could list. It was suggested that these lists be submitted to the Board and then mimeographed.

A few answers to the circular were received. Mr. Downes has promised a list of Hemiptera. Mr. Garret has promised practically the whole of the Diptera when we ask for it, and has already sent a list of his new descriptions in the Blepharoceridae, Chironomidae and Dixidae. Mr. Buckell and myself have already published lists of the orthoptera and aphididae respectively, as far as they are known. Mr. Hearle has the mosquitos written up. Several workers in Lepidoptera have referred us to Mr. Blackmore, who wishes the whole subject discussed at this meeting, as doubtless it will be.

The financial statement is appended.

R. GLENDENNING,
Hon. Secretary-Treasurer

Agassiz, B. C., February 25th, 1926.

FINANCIAL STATEMENT FOR THE YEAR 1925

Receipts		Expenditures	
Balance from 1924	$176.55	Printing programmes, 1924	$ 8.40
Subscriptions	49.00	Printing programmes, 1925	9.98
Bank Interest	5.05	Rent of meeting room	10.00
Prov. Govt. Grant	250.00	Dues to Ontario Society	31.17
		Printing Proceedings No. 22	195.30
		Express, postage and sund...	31.50
		Balance in bank	194.25
	$480.60		$480.60

R. GLENDENNING,
Hon. Secretary-Treasurer

Audited and found correct,
J. W. EASTHAM, Honorary Auditor.

REPORT OF THE SECRETARY-TREASURER FOR THE YEAR 1926

I beg to submit the following report on the activities of the Society for the past year:

FINANCES

The Society ends the present year with a credit balance of $120. This will all be absorbed by Proceedings No. 23, at present in the press.

MEMBERSHIP

The membership remains at thirty-five; some old members have dropped out, but others have taken their places.

Arrears of subscriptions amount to $14.00, as compared with $25.00 last year.

PROCEEDINGS

During the past year the original Quarterly Bulletins of the Society, published from 1906 to 1908, have been reprinted at a cost of $225.00.

Proceedings No. 23, consisting in a list of Hemiptera of British Columbia, contributed by Mr. Downes, is at present in the press. This is being published in accordance with the plan of the Society to print check lists of all the orders of inserts occurring in the province.

I have in manuscript a check list of the mosquitos of the province prepared by Mr. E. Hearle, and I believe other members are working up further groups.

LIBRARY

I am glad to be able to report that we have at last compiled a catalogue of books, periodicals and pamphlets in the Society's library. This is the result of the combined work of Mr. Downes, Mr. Buckell, and the Secretary. The list has been divided into economic and systematic papers, arranged alphabetically under the authors' names, and separated into the chief orders of insects.

This list, with the supplementary report of 1916, gives a complete catalogue of literature available for borrowing by members of the Society.

Besides numerous pamphlets received in exchange for our Proceedings, the following books have been added this year:

Textbook of Entomology	Imms.
Anatomy and Physiology of the Honey Bee	Snodgrass
Principles of Insect Control	Wardle & Buckle
Manual of Entomology	Comstock
The Plecoptera or Stone Flies	Needham & Claasen
Insects Affecting Domestic Animals	Osborn

The last two being presented by Mr. Whittaker.

I am glad to state that we have located numerous missing numbers of several journals, etc., received in years gone by in exchange for our proceedings, and we now have the "Canadian Entomologist," complete since 1896, and the "Entomological News" for the last ten years.

A suitable bookcase has now been provided for the library, which is housed in Mr. Downes' office in the Parliament Buildings, Victoria, where applications for the loan of matter should be addressed.

R. GLENDENNING,
Hon. Secretary-Treasurer.

Agassiz, B. C., February 25th, 1927.

FINANCIAL STATEMENT FOR THE YEAR 1926

Receipts		Expenditures	
Balance from 1925	$194.25	Printing programmes and letterheads	$ 17.33
Subscriptions for 1926	55.00	Rent of meeting room, Victoria	7.50
Subscriptions, previous arrears	11.00	Dues to Ontario Society	34.00
Bank interest	7.40	Re-printing Bulletins	225.00
Sale of Proceedings	6.00	Express and postage	25.15
Prov. Government Grant	250.00	Books purchased for library	24.65
		Bookcase for library	16.40
		Secretary's honorarium	50.00
		Sundries	2.95
		Balance in bank	120.67
	$523.65		523.65

R. GLENDENNING,
Hon. Secretary-Treasurer

Audited and found correct,
J. W. EASTHAM, Honorary Auditor.

PRESIDENTIAL ADDRESS

BY J. W. WINSON

TO THE MEMBERS OF THE BRITISH COLUMBIA ENTOMOLOGICAL SOCIETY:

GENTLEMEN:

It is customary in learned and scientific societies to elect one of the most learned or scientific of the members to the presidential chair. The presidency is regarded as a decoration for merit, honorably achieved in research or practise. No society ever made such a violent departure from that age-old custom as you did last year when you raised to the chair one of the least important of your members; one who had done absolutely nothing in its service, and who knew less than any other member of the science to which the Society is devoted. For twelve months I have tried to discover a reason for this variation, and I can only guess that specialization has become so pronounced in the Society that you were alarmed lest it break up into unrelated divisions, and therefore, if you appointed one who held you all in reverence, and gazed at each with equal wonder and ignorance, you could pursue your courses without hindrance or interruption, because he would not know enough to interfere. If that was your reason, you have succeeded admirably, and may be congratulated on your choice.

When I joined this Society years ago, I knew nothing entomologically beyond an intimate acquaintance with the bee and the flea. I kept a few colonies and a flock of chickens. My chief motive in joining was curiosity. I wanted to know the men who could be interested eagerly in grubs and bugs, and I was astonished at the interest it gave me, not only in the science but in the members. My continued membership has been due to the agreeable characters I have met and the friendships I have gained. There are old members, admired and reverenced for their pioneering work, and younger folk whose zeal and optimism are most refreshing. I have received letters from a feminine member whose "mouth watered" for the aphids on my ivy, and one of the several members who have visited my home created a sensation in the village on his arrival. I met him at the station in the spring sunshine, when the Buprestidae and the Cerambycidae were flying, or so he said. His baggage, that seemed suspiciously large for a week-end visit, was flung to the ground and rummaged until a monstrous net was unpacked and set up. Then began much sweeping over ditch and sidewalk, while the natives, down for their mail, stood wondering.

It took me months to recover my good reputation for sobriety and sanity, for of course I helped with the killing-bottles. I have been in close-packed dens with other members, poring over microscopes and setting boxes, interested, certainly, in the subject, but often more enthralled by

the enthusiasm of the member whose devotion to his order has added life to his existence and has opened the folds of knowledge a little wider, that others may pass more easily. Such experiences have been very good, and have made my membership with this Society very precious.

Leaving the subject of myself, rather reluctantly, I wish to congratulate the Society on its own standing, and its mission. Good work, practical and original, is being done here; work that the layman can recognize and the learned respect and, in the system of exchange in knowledge with other Societies, this of British Columbia has no need for shame.

And as Entomologists the great public is coming more and more to respect your work. He who was yesterday a "feeble-minded butterfly catcher" is to-day regarded as the saviour and defender of crops and flowers.

The more man learns about his foods and its production, the nature of the parasites that beset himself and the creatures about him, the more he turns for light and salvation to the entomologist whom he was wont to deride.

The Christian knows that the last enemy that shall be destroyed is death. The scientist begins to see that the last but one of the hosts that would defeat him is that of the insects, and when we regard the evils and the dangers that fly by day and creep by night, wars with human enemies seem puerile interruptions in this great campaign, which needs all our energy and enterprise. One government this year is spending ten million dollars in fighting one insect, and this without hope of extinction—only control is expected.

Geology gave us wealth in mineral and fuel; chemistry, in a thousand conveniences and comforts. Physics is easing and lighting our path, but now entomology must be given the lead, or, with all these blessings and advances, we may starve by the way. For the twenty-sixth time, you B. C. Entomologists are meeting to gather and co-relate news from the Front.

I trust the conference will be of benefit and encouragement to all.

Sir Joseph Hooker once said to a number of Scientists: "Too much of our dear-bought experience dies with us." This meeting is instituted that such experience shall not die, but shall be distributed for the enlightenment of others, and in these efforts I wish you all success.

LIST OF MOSQUITOES OF BRITISH COLUMBIA

Recorded to December 31, 1926

BY ERIC HEARLE, DOMINION ENTOMOLOGICAL BRANCH

Family **CULICIDAE**

Sub-family **CULICINAE**

Tribe **Culicini**

Tribe **Anophelini**

Sub-family **CHAOBORINAE**

Sub-family **DIXINAE**

Sub-family **CULICINAE**

Tribe **Culicini**

Genus **CULEX** Linnaeus

Sub-genus **Neoculex** Dyar

(1) **Culex apicalis** Adams:—*Wellington, August, 1906 (Dyar & Caudell); *Royal Oak, April, 1917 (R. C. Treherne); Savory Island, April 10th, 1917 (R. S. Sherman); Vancouver, April 22nd, 1917 (R. S. Sherman); *Pitt Meadows, June 7th, 1919(E. Hearle); *Mission, October 9th, 1919 (E. Hearle); *Dewdney, July 4th, 1919 (E. Hearle); *Agassiz, June 20th, 1919 (E. Hearle); *Agassiz, June 20th, 1919 (E. Hearle); Summerland, March 20th, 1924 (E. Hearle); Osoyoos, July 24th, 1920 (E. Hearle); †Cranbrook — — (C. Garrett).

Sub-genus **Culex** Linnaeus

(2) **Culex pipiens** Linnaeus:—*Vancouver, January 11th, 1917 (R. S. Sherman).

(3) **Culex tarsalis** Coquillett:—*Wellington, August 8th, 1906 (Dyar & Caudell); *Royal Oak, April, 1917 (R. C. Treherne); Fort Langley, July 23rd, 1921 (E. Hearle); *Mission, August, 1919 (E. Hearle); Hatzic, June 20th, 1921 (E. Hearle); *Chilliwack, July 3rd, 1919 (E. Hearle); *Harrison, June 20th, 1919 (E. Hearle); Kelowna, 1923 (E. Hearle); Summerland, August 27th, 1920 (E. Hearle); Oliver, April 12th, 1923 (C. Garrett); †Cranbrook — — — (C. Garrett).

Genus **THEOBALDIA** Neuve-Lemaire

Sub-genus **Culicella** Felt

(4) **Theobaldia dyari** Coquillett:—*Kaslo, May 29th, 1903 (H. G. Dyar); *Kwinitsa, June 10th, 1919 (H. G. Dyar).

Sub-genus **Theobaldia** Neuve-Lemaire

(5) **Theobaldia alaskaensis** Ludlow:—*Atlin, July 26th, 1919 (H. G. Dyar); *Hope, May 20th, 1919 (E. Hearle); Lillooet, June 23rd, 1917 (M. Ruhman); Chilcotin, May 7th—August 22nd, 1920 (E. R. Buckell); Oliver, April 16th, 1923 (C. Garrett); †Cranbrook — — (C. Garrett).

(6) **Theobaldia incidens** Thompson:—Victoria, August, 1919 (E. Hearle); Savory Island, August 19th, 1915 (R. S. Sherman); Vancouver, January 7th, 1917 (R. S. Sherman); *Caulfeilds, May 3rd, 1919 (E. Hearle); *Mission, June 14th, 1919 (E. Hearle); *Agassiz, April 22nd, 1919 (E. Hearle); Chilliwack, July, 1919 (E. Hearle); Popcum, May 23rd, 1919 (E. Hearle); Yale, July 19th, 1920 (E. Hearle); *Metlakatla, August 1st, 1910 (G. H. Keen); *Prince Rupert, May 31st, 1919 (H. G. Dyar); *Atlin, July 26th, 1919 (H. G. Dyar); *Hazleton, September 9th, 1919 (H. G. Dyar); Vernon, March 25th, 1924 (E. Hearle); Penticton, August 21st, 1920 (E. Hearle); Oliver, April 13th, 1923 (C. Garrett); Minnie Lake, Nicola, July 25th, 1925 (N. Criddle); †Cranbrook — — — (C. Garrett).

(7) **Theobaldia impatiens** Walker:—Savory Island, April 9th, 1917 (R. S. Sherman); Vancouver, March 20th, 1916 (R. S. Sherman); *Caulfeilds, May 3rd, 1919 (E. Hearle); *Clayburn, March 25th, 1919 (E. Hearle); *Hatzic, April 14th, 1919 (E. Hearle); Davis Lake, July 10th, 1921 (E. Hearle); Dewdney, July 18th, 1919 (E. Hearle); *Agassiz, June 1st, 1917 (A. E. Cameron); Sumas Prairie — 1858 (G. H. Lord); Sardis, May, 1919 (E. Hearle); *Hope, May 20th, 1919 (E. Hearle); Mount Cheam, August, 1907 (R. S. Sherman); *Prince Rupert, May 14th, 1919 (H. G. Dyar); Massett — — — —; *Terrace, August 14th, 1919 (H. G. Dyar); Sicamous, May 5th, 1922 (E. Hearle); *Kaslo, July 19th, 1903 (H. G. Dyar); †Cranbrook — — — — (C. Garrett).

(8) **Theobaldia inornatus** Williston:—*Nicomen, July 27th, 1919 (E. Hearle); Vernon, March, 1924 (E. Hearle); Kelowna, August 28th, 1923 (E. Hearle); Summerland, August 27th, 1920 (E. Hearle); Penticton, August 21st, 1920 (E. Hearle); Oliver, April 20th, 1923 (C. Garrett; †Cranbrook — — — — (C. Garrett).

Genus **MANSONIA** Blanchard

Sub-genus **Coquillettidia Dyar**

(9) **Mansonia perturbans** Walker:— *Vancouver, August 22nd, 1919 (E. Hearle); Capilano Canyon, August, 1919 (E. Hearle); *Hatzic, July 22nd, 1919 (E. Hearle); Nicomen, July 7th, 1920 (E. Hearle); *Kaslo, July 2nd, 1903 (R. P. Currie).

Genus **AEDES** Meigen

Sub-genus **Ochlerotatus** Lynch Arribalzaga

(10) **Aedes pullatus** Coquillett:—*Kwinnitsa, May 29th, 1919 (H. G. Dyar); *Kaslo, July 23rd, 1903 (H. G. Dyar; *Bennett, July 28th, 1919 (H. G. Dyar); *Atlin, July 23rd, 1919 (H. G. Dyar).

(11) **Aedes intrudens** Dyar:—*Kwinitsa, May 22nd, 1919 (H. G. Dyar); *Salvus, June 3rd, 1919 (H. G. Dyar); *Terrace, August 12th, 1919 (H. G. Dyar); †Cranbrook — — — — (C. Garrett).

(12) **Aedes diantaeus** Howard, Dyar & Knab:—*Salvus, June 9th, 1919 (H. G. Dyar); *Terrace, August 13th, 1919 (H. G. Dyar).

(13) **Aedes punctor** Kirby:—Mission, May, 1920 (E. Hearle); McConnell Creek, July 10th, 1921 (E. Hearle); *Agassiz, May 1st, 1919 (E. Hearle); Laidlaw, May, 1919 (E. Hearle); *Kwinista, May 22nd, 1919 (H. G. Dyar); *Atlin, July 22nd, 1919 (H. G. Dyar); *Terrace, August 12th, 1919 (H. G. Dyar); *Hazleton, September 6th, 1919 (H. G. Dyar); *Prince George, May 12th, 1919 (H. G. Dyar); Revelstoke, August, 1920 (E. Hearle); Greenslide, August, 1920 (E. Hearle); Wigwam, August, 1920 (E. Hearle); Arrowhead, August, 1920 (E. Hearle); *Field, August 15th, 1903 (H. G. Dyar); †Cranbrook — — — — (C. Garrett).

(14) **Aedes leuconotips** Dyar:— *Prince Rupert, May 22nd, 1919 (H. G. Dyar).

(15) **Aedes cyclocerculus** Dyar:— *Prince Rupert, May 11th, 1919 (H. G. Dyar.

(16) **Aedes aboriginis** Dyar:— *Royal Oak, May 4th, 1917 (R. C. Treherne); *Westholme, May 3rd, 1917 (A. E. Cameron); Victoria, March 28th, 1920 (W. B. Anderson); Coquitlam, June 25th, 1921 (E. Hearle); Mission, July 14th, 1920 (E. Hearle); McConnell Creek, June 18th, 1921 (E. Hearle); *Prince Rupert, May 11th, 1919 (H. G. Dyar).

(17) **Aedes spencerii** Theobald:— *Kaslo, June 13th, 1903 (R. P. Currie).

(18) **Aedes idahoensis** Theobald:— Nicola Lake, June 9th, 1922 (E. R. Buckell); Douglas Lake, June 13th, 1922 (E. R. Buckell); Aspen Grove, June 14th, 1922 (E. R. Buckell); Osoyoos, August 21st, 1920 (E. Hearle); †Cranbrook — — — — (C. Garrett).

(19) **Aedes hirsuteron** Theobald:— Kamloops, August, 1920 (E. Hearle); *Sicamous, July 28th, 1916 (C. G. Hewitt); Revelstoke, August 12th, 1920 (E. Hearle); Donald, August 12th, 1920 (E. Hearle); Golden, August 14th, 1920 (E. Hearle); *Wigwam, August 14th, 1903 (H. G. Dyar); Arrowhead, August 13th, 1920 (E. Hearle); *Lardo, July 7th, 1903 (H. G. Dyar); *Kaslo, July 4th, 1903 (H. G.

Dyar); *Ainsworth, July 10th, 1903 (H. G. Dyar); Okanagan Falls, July 30th, — (C. G. Hewitt); Nicola Lake, July 17th, 1922 (E. R. Buckell); Aspen Grove, July 17th, 1922 (E. R. Buckell).

(20) **Aedes aldrichi** Dyar & Knab:— ††Nanoose Bay, August 1st, 1903 (J. Fletcher); White Rock, July 31st, 1920 (E. Hearle); Coquitlam, June 25th, 1921 (E. Hearle); Fort Langley, July 23rd, 1921 (E. Hearle); *Ruskin, July 23rd, 1919 (E. Hearle); Silverdale, June 17th, 1921 (E. Hearle); Steelhead, June 19th, 1921 (E. Hearle); Davis Lake, July 10th, 1921 (E. Hearle); *Mission, August 4th, 1919 (E. Hearle); McConnell Creek, July 10th, 1921 (E. Hearle); *Nicomen Island, June 15th to August 3rd, 1919 (E. Hearle); *Abbottsford, July 12th, 1920 (H. G. Dyar); *Chilliwack, July 2nd, 1919 (E. Hearle); Harrison Mills, July, 1921 (E. Hearle); *Agassiz, July 16th, 1919 (E. Hearle); Laidlaw, July, 1920 (E. Hearle); *Hope, August 3rd, 1919; Yale, July 19th, 1920 (E. Hearle); Chase, May 27th, 1919 (W. B. Anderson); Sicamous, August 3rd, 1921 (E. Hearle); Vernon, August 6th, 1920 (R. C. Treherne); ††Prince George, September 7th, 1919 (H. G. Dyar).

(21) **Aedes impiger** Walker:— *Atlin, July 22nd, 1919 (H. G. Dyar); *Prince George, May 11th, 1919 (H. G. Dyar); Barkerville, August 14th, 1921 (E. R. Buckell); Vernon, May 9th, 1922 (E. Hearle); Penticton, May 1st, 1919 (E. R. Buckell); Fairview, May 4th, 1919 (E. R. Buckell); Oliver, April 16th, 1923 (C. Garrett); Glacier, July 27th, 1916 (C. G. Hewitt).

(22) **Aedes cataphylla** Dyar:— *Atlin, July 22nd, 1919 (H. G. Dyar); *White Pass, July 28th, 1919 (H. G. Dyar); Chilcotin, May 30th to July 9th, 1920 (E. R. Buckell); *Mount Cheam, August 7th, — (J. Fletcher); Lillooet, May 3rd, 1916 (Tom Wilson); Vernon, May 5th, 1923 (E. Hearle); Nicola Lake, June 9th, — July 17th, 1922 (E. R. Buckell); Oliver, April 20th, 1923 (C. Garrett); Osoyoos, May 19th, 1923 (C. Garrett); †††Kaslo, 1903 (Dyar, Caudell & Currie); †††Cranbrook, May 12th, 1922 (C. Garrett); Glacier, July 27th, 1916 (C. G. Hewitt); *Field, August 15th, 1906 (H. G. Dyar).

(23) **Aedes pacificensis** Hearle:—Discovery Island, (near Victoria), April 12th, 1920 (W. B. Anderson).

(24) **Aedes communis** De Geer, form lazarensis F. & Y.:—Vancouver, April 17th, 1915 (W. B. Anderson); Hatzic, July 11th, 1921 (E. Hearle); Davis Lake, July 10th, 1921 (E. Hearle); McConnell Creek, July 10th, 1921 (E. Hearle); Nicomen Island, July 20th, 1920 (E. Hearle); *Kwinitsa, May 24th, 1919 (H. G. Dyar); *Atlin, July 22nd, 1919 (H. G. Dyar); *Salvus, May 27th, 1919 (H. G. Dyar); *Terrace, August 12th, 1919 (H. G. Dyar); *Prince George, May 9th, 1919 (H. G. Dyar); Vernon, May 5th, 1922 (E. Hearle); Penticton, May 5th, 1919 (E. R. Buckell); Oliver, April 20th, 1923 (C. Garrett);

*Kaslo, June 11th, 1902 (H. G. Dyar); Cranbrook, May 1st, 1922 (C. Garrett); *Glacier, July 28th, 1916 (C. G. Hewitt).

(25) **Aedes pionips** Dyar:—*Kwinitsa, May 25th, 1919 (H. G. Dyar); *Atlin, July 22nd, 1919 (H. G. Dyar); *Terrace, August 12th, 1919 (H. G. Dyar); *Prince George, May 9th, 1919 (H. G. Dyar); †Cranbrook (C. Garrett).

(26) **Aedes dorsalis** Meigen:—*Qualicum, July 2nd, 1903 (J. Fletcher); *Nanoose Bay, August 1st, 1903 (J. Fletcher); *Duncans, August 6th, 1906 (Dyar & Caudell); *Victoria, August 29th, 1919 (E. Hearle); *Buccaneer Bay, August 24th, 1919 (E. Hearle); *Caufeilds, May 30th and August 6th, 1919 (E. Hearle); Capilano Canyon, June, 1919 (E. Hearle); *Vancouver, August 6th, 1906 (Dyar & Caudell); Summerland, August, 1920 (E. Hearle); Penticton, August, 1920 (E. Hearle); Douglas Lake, June 1st, 1925 (E. R. Buckell); Osoyoos, May 19th, 1923 (C. Garrett).

(27) **Aedes campestris** Dyar & Knab:—Chilcotin, June 2nd, August 5th, 1920 (E. R. Buckell); Kelowna, July 26th, 1918 (R. C. Treherne); Douglas Lake, June 13th, 1922 (E. R. Buckell); *Kaslo, June 21st, 1903 (H. G. Dyar).

(28) **Aedes canadensis** Theobald:—*Mission, September 10th, 1919 (E. Hearle); Dewdney, July 19th, 1921 (E. Hearle); Yale, July 19th, 1919 (E. Hearle); Vernon, August 6th, 1920 (R. C. Treherne); *Kaslo, June 3rd, 1903 (H. G. Dyar); *Prince George, May 22nd, 1919 (H. G. Dyar).

(29) **Aedes excrucians** Walker:—Hatzic, June 15th, 1919 (E. Hearle); Vernon, May 5th, 1922 (E. Hearle); Kootenay Flats, May, 1916 (Tom Wilson); Lillooet, May 3rd, 1916 (Tom Wilson); Oliver, May 16th, 1923 (C. Garrett); †Cranbrook (C. Garrett).

(30) **Aedes inequitus**, form mutatus Dyar:—Vernon, May 18th, 1920 (E. P. Venables); Oliver, May 1st, 1923 (C. Garrett).

(30a) **Aedes increpitus** Dyar, form hewitti Hearle:—Agassiz, June 15th, 1920 (E. Hearle); Yale, July 19th, 1920 (E. Hearle); Lillooet, June 23rd, 1917 (R. C. Treherne); Nicola Lake, June 18th, 1922 (E. R. Buckell); Aspen Grove, July 14th, 1922 (E. R. Buckell),

(31) **Aedes flavescens** Muller:—*Mount Cheam, August 3rd, 1899 (J. Fletcher); Chilcotin, June 18th, 1923 (E. R. Buckell); †Oliver, 1923 (C. Garrett).

(32) **Aedes aloponotum** Dyar:—Shawnigan, August 2nd, 1919 (W. Downes); **Nanaimo, August 6th, 1906 (Dyar & Caudell); Saanich, June 11th, 1919 (W. Downes); **Mission, July 18th, 1919 (E. Hearle); Hatzic, June 29th, 1920 (E. Hearle); **Harrison, June 20th, 1919 (E. Hearle); **Agassiz, May 23rd, 1919 (E. Hearle); Popcum, May 23rd, 1919 (E. Hearle); Hope, May 21st, 1919 (E. Hearle).

(33) **Aedes stimulans** Walker:—Vernon, April 23rd, 1922 (E. Hearle).

(34) **Aedes fitchii** Felt & Young, form **palustris** Dyar:—*Royal Oak, April, 1917 (R. C. Treherne); Victoria, July 5th, 1917 (A. E. Cemeron).

(35) **Aedes trichurus** Dyar:—*Kaslo, June 25th, 1903 (H. G. Dyar).
Aedes nearcticus Dyar:—No definite record—at high elevations. Simpson Pass, British Columbia or Alberta, 1923 (N. B. Sanson).

Taeniorhynchus Lynch-Arribalzaga (Sub-genus).

(36) **Aedes varipalpus** Coquillett:—*Wellington, August 8th, 1906 (Dyar & Caudell); *Nanaimo, August 6th, 1906 (Dyar & Caudell); *Victoria, August 12th, 1906 (H. G. Dyar); *Vancouver August 6th, 1906 (H. G. Dyar); *Caulfeilds, July 19th, 1919 (E. Hearle); Capilano Canyon, June, 1919 (E. Hearle); Coquitlam, June 25th, 1921 (E. Hearle); Fort Langley, July 23rd, 1921 (E. Hearle); *Mission, July 14th, 1920 (H. G. Dyar); Steelhead, June 19th, 1921 (E. Hearle); Davis Lake, July 10th, 1921 (E. Hearle); McConnell Creek, July 10th, 1921 (E. Hearle); *Deroche, June 13th, 1919 (E. Hearle); *Harrison, June 20th, 1919 (E. Hearle); Kilgard, June 17th, 1919 (E. Hearle); *Hope, May 20th, 1919 (E. Hearle); *Terrace, August 12th, 1919 (H. G. Dyar); *Kaslo, June 17th, 1903 (H. G. Dyar).

Finlaya Theobald (sub-genus).

(37) **Aedes triseriatus** Say:—Vernon, September 17th, 1921 (E. Hearle).

Aedimorphus Theobald (sub-genus).

(38) **Aedes vexans** Meigen:—New Westminster, July, 1919 (E. Hearle); Coquitlam, July, 1919 (E. Hearle); Fort Langley, July 23rd, 1921 (E. Hearle); *Whonnock, July 23rd, 1919 (E. Hearle); Silverdale, July 23rd, 1919 (E. Hearle); *Mission, June 12th to October 9th, 1919 (E. Hearle); McConnell Creek, July 10th, 1921 (E. Hearle); Matsqui Prairie, July, 1919 (E. Hearle); Hatzic, July 22nd, 1919 (E. Hearle); Nicomen Island, July 13th, 1919 (E. Hearle); Sumas Prairie, July 31st, 1919 (E. Hearle); *Chilliwack, July 3rd, 1919 (E. Hearle); Laidlaw, July, 1919 (E. Hearle); Kamloops, August, 1920 (E. Hearle); Chase, May 27th, 1919 (W. B. Anderson); Sicamous, August 12th, 1920 (E. Hearle); Vernon, June 10th, 1917 (R. C. Treherne); Kelowna, August 28th, 1923 (E. Hearle); Penticton, August, 1923 (E. Hearle); Oliver, August, 1920 (E. Hearle); Osoyoos, June 10th, 1919 (W. B. Anderson); Nicola Lake, August 29th, 1922 (E. R. Buckell); Aspen Grove, June 14th, 1922 (E. R. Buckell); Revelstoke, August 12th, 1920 (E. Hearle); Arrowhead, August, 1920 (E. Hearle); *Kaslo, June, 1903 (H. G. Dyar); *Ainsworth, June 10th, 1903 (R. P. Currie); †Cranbrook (C. Garrett); Golden, August, 1920 (E. Hearle); *Prince George, September 7th, 1919 (H. G. Dyar).

Aedes Meigen (sub-genus).

(39) **Aedes cinereus** Meigen, form **fuscus** O. S.:—New Westminster, August 19th, 1920 (E. Hearle); Douglas Island, July, 1920 (E. Hearle); Fort Langley, July 23rd, 1921 (E. Hearle); *Mission, June 23rd, 1919 (E. Hearle); McConnell Creek, June 18th, 1921 (E. Hearle); Hatzic, July 16th, 1921 (E. Hearle); *Dewdney, June 6th, 1919 (E. Hearle); *Nicomen Island, August 4th, 1919 (E. Hearle); *Chilliwack, July 3rd, 1919 (E. Hearle); *Agassiz, June 20th, 1919 (E. Hearle); Chase, May 27th, 1919 (W. B. Anderson); Sicamous, August 12th, 1920 (E. Hearle); Revelstoke, August 12th, 1920 (E. Hearle); Osoyoos, June 18th, 1919 (W. B. Anderson); *Kaslo, June 11th, 1903 (H. G. Dyar); *Prince George, September 9th, 1919 (H. G. Dyar); *Terrace, August 11th, 1919 (H. G. Dyar); *Salvus, June 7th, 1919 (H. G. Dyar); *Atlin, July 23rd, 1919, (H. G. Dyar); *Winista, June 1st, 1919 (H. G. Dyar).

ANOPHELINI (Tribe)

Anopheles Meigen (genus).

Anopheles Meigen (sub-genus).

(40) **Anopheles punctipennis** Say:—*Nanaimo, August 6th, 1906 (Dyar & Caudell); *Wellington, August 7th, 1906 (Dyar & Caudell); *Duncan, August 9th, 1906 (Dyar & Caudell); *Ladner, April 5th, 1919 (E. Hearle); Ruskin, July 30th, 1920 (E. Hearle); *Mission, July, 1919 (E. Hearle); Davis Lake, July 10th, 1921 (E. Hearle); McConnell Creek, June 18th, 1921 (E. Hearle); *Yarrow, March 25th, 1919 (E. Hearle); Chilliwack, July, 1919 (E. Hearle); Agassiz, July, 1919 (E. Hearle); *Hope, May 21st, 1919 (E. Hearle); §Lower Mainland, 1914 (S. Hadwen); New Westminster, April 9th, 1919 (E. Hearle).

(41) **Anopheles quadrimaculatus** Say:—Vernon, March 25th, 1924 (E. Hearle); Oliver, April 10th, 1923 (C. Garrett); Nicola Lake, April 5th to September 5th, 1922 (E. R. Buckell).

(42) **Anopheles maculipennis** Meigen:—*Mission, July 22nd, 1919 (E. Hearle); Hatzic, July 30th, 1921 (E. Hearle); *Nicomen Island, June 23rd, 1919 (E. Hearle); Cultus Lake, July 3rd, 1919 (E. Hearle); *Chilliwack, July 3rd, 1919 (E. Hearle); *Revelstoke, August 22nd, 1903 (H. G. Dyar); Kelowna, 1923 (E. Hearle); Oliver, April 8th, 1923 (C. Garrett); §Keremeos, 1914 (S. Hadwen); Summerland, August, 1920 (E. Hearle); †Cranbrook (C. Garrett); Chilcotin, August, 1921 (E. R. Buckell); Douglas Lake, Nicola, June 3rd, 1922 (E. R. Buckell).

CHAOBORINAE (sub-family)

Eucorethra Underwood (genus).

(43) **Eucorethra underwoodii** Underwood:—Caulfeilds, August 26th, 1919

(E. Hearle); Coquitlam, June 3rd, 1919 (E. Hearle); Mission, May 1919 (E. Hearle); Kilgard, July, 1919 (E. Hearle); ***Prince Rupert, May 31st, 1919 (H. G. Dyar); ***Kaslo, June 23rd, 1903 (H. G. Dyar).

Corethra Meigen (genus).

(44) **Corethra culiciformis**. De Geer:—***Kaslo, June, 1903 (H. G. Dyar); †Cranbrook (C. Garrett).

Chaoborus Lichtenstein (genus).

Chaoborus Lichtenstein (sub-genus).

(45) **Chaoborus crystallina** De Geer:—†Cranbrook (C. Garrett).

(46) **Chaoborus crystallina** De Geer, form **fusca** Staeger:—†Cranbrook (C. Garrett).

(47) **Chaoborus eluthera** Dyar & Shannon:—†Cranbrook (C. Garrett).

(48) **Chaoborus albipes** Johannsen:—Hatzic, July 16th, 1921 (E. Hearle); †Cranbrook (C. Garrett).

Schadonophasma Dyar & Shannon (sub-genus).

(49) **Chaoborus trivittatus** Leow:—New Westminster, May, 1919 (E. Hearle); Mission, June, 1919 (E. Hearle); ***Prince Rupert, May 13th, 1919 (H. G. Dyar); †Cranbrook (C. Garrett).

(Sub-family) **DIXINAE**

Dixa Meigen (genus).

(50) **Dixa somnolenta** Dyar & Shannon:—‡Cranbrook; ‡Wasa, April to October (C. Garrett).

(51) **Dixa serrata** Garrett:—‡Oliver, May, 1923 (C. Garrett).

(52) **Dixa neoaliciae** Garrett:—‡Cranbrook, June 26th (C. Garrett); ‡Michel, September 13th (C. Garrett).

(53) **Dixa dyari** Garrett:—‡Cranbrook, June (C. Garrett).

(54) **Dixa californica** Johannsen:—‡B. C. (C. Garrett).

(55) **Dixa dorsalis** Garrett:—‡Cranbrook, April 28th (C. Garrett); ‡Wasa, October (C. Garrett).

(56) **Dixa orientalis** Garrett:—‡Cranbrook, May (C. Garrett).

(57) **Dixa montanus** Garrett:—‡Cranbrook, June 30th (C. Garrett).

(58) **Dixa lobatus** Garrett:—‡Cranbrook, June 30th (C. Garrett); ‡Fort Steele, July 17th (C. Garrett).

(59) **Dixa rudis** Garrett:—‡Wasa, September 27th (C. Garrett).

(60) **Dixa brevis** Garrett:—‡Okanagan Falls, September 23rd, 1923 (C. Garrett); ‡Oliver, April, 1923 (C. Garrett).

(61) **Dixa fraterna** Garret:—‡Bull River, October 10th (C. Garrett).

(62) **Dixa johannseni** Garrett:—‡Cranbrook, October (C. Garrett).

(63) **Dixa distincta** Garrett:—‡‡Cranbrook (C. Garrett).

(64) **Dixa simplex** Garrett:—‡‡Cranbrook, June, October (C. Garrett).

(65) **Dixa plexipus** Garrett:—‡‡‡Nelson.

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SOME NOTES ON THE HIBERNATING HABITS OF INSECTS IN DRY TREES IN THE INTERIOR OF B. C.

BY A. A. DENNYS

During the autumn of 1925, and again in 1926, my immediate chief, Mr. E. R. Buckell, received a request from the Dominion Entomologist, Mr. Arthur Gibson, to collect specimens of lacewing flies (Chrysopid species). as a result of a request which the Department at Ottawa had received for such material from Dr. R. J. Tillyard of New Zealand. Dr. Tillyard desired Chrysopid material to liberate in New Zealand in the hope that they would assist in checking certain species of aphids which feed upon oak and other trees.

Having lived in the Salmon Arm district for many years, I could recollect having seen large numbers of these dainty little insects during

our annual winter wood-cutting operations whilst on the farm. It was only in the driest of dead trees that these insects had been seen. Armed with an axe, my collecting bag, and a lunch, I set out for many a day.

At first I met with little success; later on I was able to find a fair number every day. In 1925 we sent about 2000, and in 1926 we sent off nearly 6000 of these lacewings.

It was during the collection of the Chrysopids that I came to find out what a number of interesting insects were to be seen in their winter quarters, thus rudely disturbed.

I commenced in the last few days of October, and continued until early December. During the latter part of this time the fact that snow was upon the ground rendered the work a little more difficult.

Some of the insects showed no great aversion to the damper situations, such as that usually found under heavy bark near the ground level; however, for the majority of hibernating insects it would seem imperative that they find absolutely dry spots in which to pass the winter.

The largest number of insects found belonged to the **Lepidoptera.** Of these some 23 species, out of a total of 28, were micro moths. Next came the **Coleoptera** with 16 species. The **Diptera** supplied some 11 species. Of **Hemiptera, Neuroptera** and other small orders there were 8 species.

The **Hymenoptera** supplied the least number of all, as I only found 6 species of this order.

Added to these insects there were quite a large number of spiders, large and small, also a few of the Pseudo-scorpions, these latter being taken under the bark on live fir trees.

Before going further, I should say that my primary object was the taking of the lacewings, and that I confined my search chiefly to trees which were favoured by them.

The type of tree usually sought out by most insects for their winter's rest is a dead dry one, preferably one with loosened bark and a certain amount of dry rotten wood under the thick slabs of bark.

The tree, to attain this state, is first of all killed by lightning, fire, or one of the many causes of death. This attracts the Buprestid and other boring beetles. For some years this tree, with its tightly clinging bark and damper inner wood, is the home of the various species of woodpeckers indigenous to our woods.

In a year or two the bark is riddled with holes made in search of the boring larvae. This allows the dampness to be evaporated, causing in its turn a drying and shrinking of the inner wood, thus loosening

the bark in large patches. The loosening and drying is followed by a gradual dry rotting of the outer layers of wood in contact with the air under the loosened bark. The thick bark keeps out the moisture from rain, snow, fogs and dew.

The tree has now reached the stage when it is in the best state to act as the winter home of all these insects needing snug homes in which to escape the storms and vicissitudes of a hard, cold winter.

Their most imperative need seems to be to keep dry; when dampened, disease and fungus growths soon destroy them.

It seems that the locality of such trees has a lot to do with the number of insects resorting to them. A tree growing in thick second growth and closely hemmed in by brush is not favourable. It is continually damp, and gets little sun, at least on its lower half.

The best type of tree is one growing on the north side of small openings in the bush. Here it will be protected fairly well from northerly winds, and, most important of all factors, it will receive the most possible sunshine during the long winter and early spring. A tree of this type always has very dry bark and wood on the south side, which is the side chosen by most of the insects which stay under the bark. Those that go deeper into the rotten wood and empty borer tunnels do not seem to prefer any particular side of the tree, as there they are protected from weather conditions of all kinds.

Taking these insects in the order enumerated, I will remark upon their habits as I found them.

The largest of the moths were the Noctuids, **Litholamia napaea** Morr, **Ufeus hulstii** Smith, and **Enargia decolor** Weac. These were mostly found in the larger empty borer tunnels and rotten cavities, always in dry positions. The many species of Micros were usually taken under the bark, chiefly in the dry places occupied by the Chrysopids. In all the trees I found thousands of specimens of the Willow Leaf Miner moth, **Lithocolletis salicifoliella** Cham. They seemed to prefer to congregate in certain places. It seemed that they were fairly hardy to the weather conditions, as hundreds spend their winter along the outer bark crevices on live as well as dead trees.

There has been an unusually severe infestation of the Willow trees in the Salmon Arm section by this Leaf Miner, and perhaps any kind of winter quarters were at a premium, thus accounting for their apparent carelessness. These small moths were fairly active when disturbed even at temperatures considerably below 32°F., although they did not seem willing to actually fly very much.

Of the Coleoptera there were 15 species. Two of these, namely **Cucujus clavipes** Fab., a flat red-bodied beetle, and **Dendrophagus glaber** Lec., a small brown flat-bodied beetle, seemed to like the damper

portions under the bark. Most of the 4 or 5 species of Coccinellids were taken under the heavy outer bark of large live fir trees.

The Diptera, though only supplying eleven species, were fairly plentiful in most trees.

One of the common "Blue Bottle" flies, **Phormia regina** Mg., was quite numerous. This fly seems to penetrate as far as it possibly can into the hard dry wood, using the old tunnels of the wood-boring larvae. In some of these galleries I would come across a long row of the flies.

It was peculiar how they usually sorted themselves out as to species, even though in quite a confined space. Some tunnels would contain up to twenty or thirty flies, usually half of these would be **Phormia regina** Mg. all together, with 5 or 6 of **Anacampta latiuscula** Lw., with their brown-banded wings, at the end of the row. Often these clusters of flies would be joined by small groups of **Muscina assimilis** Fall, and **Pollenia rudis** F. The two flies of **Macrorchis** spp. and **Melina ventralis** Fall were seldom found more than two at a time, being usually solitary.

While cutting into one short dead fir stump, which, though hard shelled, was dry and rotten inside, I noticed countless thousands of a small mosquito-like fly of a species of the genus **Exechia.**

Every crack and crevice in the stump seemed filled with the insects, which poured out in a continuous dark stream from the largest cavities. As the temperature that day was a little above freezing, many of them managed to fly away as they fell. It is interesting to note that apparently all these were females (although an examination of a larger number might possibly have revealed some males).

The Hymenoptera were represented by 6 species, one of the common ants, two species of yellow wasps and three smaller undetermined insects. The wasps were found to be rather gregarious, there usually being from 4 or 5 up to 15 in a place, in dry positions and well under cover.

The Hemiptera and Neuroptera supplied another 8 species. Of these, the large black shield-shaped Stink Bug, **Brochymena affinis** Van. D., was the least particular of any in his choice of winter quarters. These large bugs were quite common, being found in groups from one or two individuals up to twenty or thirty. They usually preferred to find a dry corner, either under the loosened thick bark of dead fir trees or inside old disused beetle tunnels.

On days when the temperature was above the freezing mark these large black fellows had to be treated with care and circumspection; when disturbed or touched by the collector's forceps, they lost no time in discharging with surprising accuracy a minute jet of whitish and

pungent smelling fluid. On frosty days they appeared quite immobile and unable to cause trouble.

Another member of the Hemiptera, **Leptoglossus occidentalis** Heid, was found occasionally in dry positions, sometimes alone or in twos or threes, although usually they were in company with the former bug.

By far the most numerous of all the insects were the Lacewings, for which I was primarily searching.

If the temperature was above 36°F., they took to their wings quite readily. Below this temperature and down to about 20°F., they seemed quite capable of crawling around, losing no time in disappearing from sight.

At this point I would note that this particular Chrysopid is absolutely odourless, whilst another species which I have frequently taken in the Kootenay section and elsewhere has the most objectionable odour it is possible to imagine!

These insects hibernate always in dry positions. They like to crawl into the longitudinal cracks always to be found in dry fir trees. In such positions they were almost inaccessible, as their removal necessitated the splitting of the whole tree.

Most of the lacewings which I took were found under the bark and in the crevices formed in the dry rotten wood around the base of the tree. In some cases, with trees 2 or 3 feet in diameter, this rotten wood extended in to within one foot of the center of the tree.

After chopping off all the bark within reach of the ground and working out any rim of rotten wood inside, the trees were chopped down. Lacewings and other insects were found to occur quite near the top of the tree, a matter of 100 feet or so. It was noted, however, that the majority occurred within the lower fifteen feet on most trees.

Sometimes the removal of one slab of bark would reveal a hundred or more of the gauzy-winged green Chrysopids. Many specimens in these large gatherings always escaped before being placed in the bottles used for their collection.

It was curious to note that in many places large numbers of their wings alone were found, showing that they were raided by some predacious enemy. Very often the lacewings and the large black stink bugs occupied the same tunnels in peaceful bliss. I rather believe that there must be warfare in the spring when activity commences.

Nearly all the trees used in this collecting work were Douglas fir trees. I found a certain number, however, in a few dry yellow pines examined. The lacewings seemed only to inhabit those trees which were sound enough in their interior to withstand the storms of winter.

On many occasions I noticed that trees which seemed otherwise suitable contained no lacewings. Invariably these trees had little sound wood left in the center, being easily chopped down. Instinct seems to advise them as to which trees are likely to be blown down during the winter, thus causing their death by becoming too damp upon the ground.

Similarly they avoid stumps less than about 20 feet in height, especially so if these stumps showed signs of weakness.

For shipment I placed the lacewings in glass fruit jars with muslin tops, one-quart jars holding about 1500 comfortably. Inside the jars I placed inverted paper cones, made by folding and refolding an 8-inch square of rough paper. This allowed the insects to crawl up into fairly natural crevices where they were out of sight and quite comfortable.

Below I am giving the complete list of names of all the insects I found hibernating in dry trees. Of these some of the Coccinellid beetles were taken from the bark of green fir trees.

Names of Insects found in Hibernation.

LEPIDOPTERA.

Litholamia napaea Morr.
Ufeus sp. near hulstii Smith.
Enargia decolor Weac.
Epinotia crenana Hon.
Epinotia crenana, form mediostriana, Kgt.
Agonopteryx rosaciella Bsk.
Cerostoma sp. (radiatella Don.?)
Mompha unifasciella Chambers.
Nothris (Gelechia) monella Busck.
Lithocoletis salicifoliella Cham.
Ornedos hexadactyla Linn.

COLEOPTERA.

Upis ceramboides Linn.
Tenebrio molitor Linn.
Temnochila virescens Fab. (var.)
Cucujus clavipes Fab. (var.)
Adelocera profusa Cand.
Ostoma ferruginea L.
Silpha lapponica Hbst.
Dendrophagus glaber Lec.
Dermestes signatus Lec.
Buis estriatus Lec.
Microbregma emarginatum Duft.
Adalia frigida Schn.
Adalia humeralis Say.
Harmonia picta Rand.
Scymnus sp.

DIPTERA.

Eristalis tenax L.
Muscina assimilis Fall.
Anacampta latiuscula Lw.
Epochra rubida Coq.
Phormia regina Mg.
Pollenia rudis F.
Hebecnema vespertina Fall.
Mellina ventralis Fall.
Fannia incisurata Zett.
Exechia sp.
Macrorchis sp.

HEMIPTERA, NEUROPTERA, Etc.

Brochymena affinis Van. D.
Leptoglossus occidentalis Heid.
Agallia sanguinolenta Prov.
Cicadella hieroglyphica var. confluens Uhl.
Banasa sordida Uhl.
Lyctocoris sp.
Hemerobias sp.
Chrysopid sp.

HYMENOPTERA. (Undetermined).

2 species "Yellow Jacket" wasp.
1 species of ant (winged and wingless).
3 other small hymenopterous insects all less than ¼ inch in length

A DEAD DOUGLAS FIR
SHOWING WHERE LACEWINGS ARE FOUND.
—(Original.)

ENTOMOLOGICAL NOTES OF VETERINARY INTEREST

By E. A. Bruce, Agassiz, B. C.

A crude survey of the literature indicates that there are about 150 different disease producing organisms transmitted to man and other warm-blooded animals by approximately 250 species of insects. This does not include the several hundred species that cause injury or annoyance by their direct attack on animals. It is therefore obvious that the subject of entomological notes of veterinary interest could be made to cover a lot of ground; we purpose, however, to confine our remarks to three items of local interest—Drosophilids in milk, **Eristalis tenax** larvae from a cow, and ticks.

Drosophilids in milk

Upon some five occasions, in 1919 and 1920, the City of Vancouver received complaints of insects, worms or hay seeds in milk, which were subsequently shown to be the pupae of Drosophilids. The record was of interest, as only two references of such parasites in milk could be found in the literature, one being recorded by Riley from Minnesota in 1918, and the other from Germany in 1913.

A milk bottle received by us showed eleven pupae firmly adherent to the glass. After being kept three days, six flies emerged, which were identified as Drosophilids by the late Mr. R. C. Treherne; the flies were subsequently sent to Ottawa, but no specific determination has as yet been received.

It was said that in every instance the pupae were found within a given distance from the bottom of the bottle, suggesting that some sour milk had been left therein, and that they were usually found towards one side of the bottle, indicating the heliotropic tendency of the flies.

The duration of life for the genus at living room temperature is given as being two days for the egg period, six for the larval, and five for the pupal; it is therefore interesting to note the apparent amount of interference that these parasits can stand, as the bottles were handled, as follows:

In washing, a 10% solution of "Wyandotte" soda is used. The bottles first enter a cold bath, then a warm bath, and thirdly a bath the temperature of which is from 160 to 165°F. They are then rinsed in hot water and allowed to dry by the heat left in the glass, which is almost too hot to be borne by the bare hands. It was thought that some dairies might have been economising on the amount of soda used, but this could not be definitely shown; the trouble ceased, however, when greater care in washing was taken and the dairymen were warned

that a repetition might lead to unsought advertising via the courts. No further cases have come to our notice.

Eristalis tenax larvae from a cow.

The point of interest is that these larvae were found to be living in a cow's vagina, and that only one other case is on record, which occurred in Maryland in 1909.

The cow in question was living on Vancouver Island, and was a Grade Ayshire calved about two months. The stable was in a filthy condition, and the animal had a vaginal discharge for which the owner had been douching several times before any larvae were seen. The vagina contained some inspissated pus and blood-stained exudate, and the animal showed a slight rise in temperature and a greatly reduced milk yield. The parasites, in spite of antiseptic douches, appeared to be vigorous and very active. We are unable to say just how many were present, but we received a dozen specimens. In this case it is probable that the diseased condition of the vagina was responsible for an odor that attracted the flies, with the result that they deposited their young in this unusual location. With proper attention the cow made a complete recovery.

Ticks

While we have a number of ticks in British Columbia, only two are of particular interest—**Dermacentor albipictus** and **D. venustus. D. albipictus,** known as the winter or moose tick; it is a one-host tick, commonly found on the large domesticated and wild mammals. When present in large numbers, it may cause trouble. We have reports of it causing anaemia and even death in horses in the Okanagan, and we have recently known of a mule deer brought down to the coast and placed on a game reserve that died from the effect of these parasites, and of another mule deer that nearly succumbed.

Being a one-host tick, it is comparatively easily controlled by dipping in the early spring or late autumn.

D. venustus feeds only on the blood of mammals and require three hosts. The adults are commonly found on the larger animals, chiefly horses, cattle and sheep. They may also be found on a number of smaller animals, such as rabbits, porcupines, bears, coyotes, mountain sheep and goats, deer, etc. The nymphal and larval stages are passed on rodents, such as ground squirrels, deer mice, field mice, chipmunks, pack rats, jack, cottontail and snowshoe rabbits, etc.

The life cycle from egg to adult is seldom completed under two years, and may take three or even four.

D. venustus is by far the most dangerous tick we have in Canada,

as it may produce paralysis and even death in man and animals, and is known to carry the organisms of Rocky Mountain spotted fever and of tularaemia. So far as known, spotted fever and tularaemia have not been reported as occurring in this country.

Spotted fever extends throughout the northwestern states and as far south as northern California. It is an acute febrile affection, with a tendency to stupor. The eruption, which appears about the third to fifth day, is not unlike typhus fever, and tends to become haemorrhagic. All stages of the tick may be infective. They have been known to be infective for seventeen months, which is approximately the maximum life period of an unfed adult.

Tularaemia in man is usually chronic in character and may last for weeks or months. It is characterized by fever, chills, headache, nausea, and marked prostration. Glandular enlargement may be present. That the disease is very highly infectious is evident from the large number of laboratory workers that have become affected while working with the disease; even the excreta of affected ticks is infectious. The disease has been noted from the Pacific to the Atlantic coasts, and, in addition to **D. venustus**, can be carried by a number of vectors—by the bed-bug, squirrel, flea **(Ceratophyllus acutus)**, deer fly **(Crysons discalis)**, rabbit louse **(Hemoddipsus ventricosus)**, and the rabbit tick **(Haemaphysalis leporis-palustris)**. The rabbit tick is of importance because of its wide distribution and the fact that snowshoe, jack, and cottontail rabbits are susceptible to tularaemia and therefore serve as reservoirs of infection.

Tick paralysis in British Columbia is essentially a disease of the early spring. Occasionally it occurs as early as the latter part of February, is common in March and April, and is rarely seen after the middle of May. The disease is confined to those sections in which the tick is found, that is over the drier sections of the southeastern part of the province, the furthest point north being about 100 miles north of Kamloops.

Children and sheep are chiefly affected, but cases have occurred in cattle, dogs, and adult men.

Symptoms in sheep are: Restlessness, staggering gait, later falls and cannot rise but struggles; as paralysis advances, struggles cease. Eyes bright and no elevation of temperature. Animals paralysed on an average about two days. The onset is sudden, and in some cases a sheep apparently well may an hour later be staggering, twenty minutes later be completely paralysed, and two hours later be on its feet again. Death may occur.

Treatment consists in removing rapidly gorging females, which will be found chiefly about the head, neck and within a few inches of the spine; the region above the hocks and knees should also be examined.

Recovery usually takes place in about four hours.

The symptoms in man are as follows: Onset sudden, has difficulty in walking, and in a few hours may be unable to stand. The hands and arms are affected next. There may be difficulty in swallowing and in articulation; it may be impossible to protrude the tongue, or, if protruding to withdraw it. Mucus may collect in the throat with apparent choking, but vomiting does not occur as a rule. Constitutional symptoms are slight; there may be some restlessness in the early stages and complaints of feeling "a bit seedy." In one case in an adult he described his condition as resembling that of being partially "drunk." There is no pain, the temperature is usually normal, and the pulse may be normal or faster than usual. The special senses are not involved.

The time elapsing from beginning of symptoms to complete paralysis, and even death, may be less than two days, but is usually from three to five. The chances of recovery are favourable if paralysis has not progressed so far as to effect the heart or respiration. At least two fatal cases have occurred this year in children, and it is regrettable that such should occur in view of the well marked symptoms and the simplicity of treatment, which consist in removing the tick. Usually only one tick is present in such cases, and it is generally situated around the nape of the neck; it may, however, be elsewhere. In our experience such a tick is always a rapidly gorging female, which, having increased in weight some five to six hundred times, is now about the size of a bean, bluish in colour and comparatively easily found. Improvement is rapid once the tick is removed. In removing, care should be exercised that the capitulum (false head) is not left in the skin, as it is liable to set up a pruritis that may last for months; indolent ulcers or abscesses may also form. If there is any doubt, it is advisable to nip off a small piece of skin with sharp scissors. Ticks may be induced to let go by covering them with any oil or grease, which has the effect of blocking their breathing apparatus, situated just back of the fourth pair of legs. A drop of chloroform is also effective, and touching with the hot end of a cigarette may cause them to let go.

The cause of tick paralysis is not known, but the negative inoculations, lack of fever, and rapid recovery are against infection. It is thought that when gorging rapidly a toxic substance is secreted in greater quantity than the body can accomodate in a given time. Where only one tick is present on a paralysed case, it will invariably be found to be a female, and with sheep, where there may be hundreds of ticks, recovery will take place if rapidly gorging females are removed and no attention be paid to the males or unengorged females.

Control measures against **D. venustus** must follow two main lines of attack: the control of the adult ticks, and of the immature forms through the rodents upon which they feed.

AN ANNOTATED LIST OF THE ANTS OF BRITISH COLUMBIA

By E. R. Buckell

The present list is intended as a foundation on which to build up a list of the Ants of British Columbia.

The writer is indebted to Prof. W. M. Wheeler for the identification of material.

Family **FORMICIDAE**

Sub-family **Myrmicinae**

Genus **Solenopsis** Fabricius

Solenopsis molesta Say.

Nests under stones. A small ant, with queens large in comparison to the small monomorphic workers. A common species in British Columbia.

Genus **Pheidole** Westwood

Pheidole oregonica Emery.

A nest of these ants was found under a stone at Osoyoos, in the spring of 1925. Besides the queens and the minute workers there were a few individuals with enormously enlarged heads and jaws. These probably acted as soldiers and also crushed up the plant seeds on which this ant feeds to a large extent.

Genus **Stenamma** Westwood

Stenamma nearcticum Mayr.

Recorded from British Columbia by Prof. W. M. Wheeler in his "List of Described North American Ants."

Genus **Aphaenogaster** Mayr.

Aphaenogaster subterranea Latr. subsp. **occidentalis** Emery.

A sluggish ant, nesting under stones, and in all conditions of soil, from moist meadows to dry sage-brush land. It has been observed to carry its larvae and pupae to the surface of the soil on hot days. A reddish brown ant 5 to 6 mm. long.

Genus **Pogonomyrmex** Mayr.

Pogonomyrmex occidentalis Cresson.

This interesting harvester ant occurs only in the warmest and dryest locations in the southern end of the Okanagan Valley from the boundary line to Penticton. Its typical nests (low mounds of pebbles around which a considerable area is kept entirely free from all vegetation) occur only as far north as Oliver. North of this point, only very

weak colonies will be found under stones; and when Penticton is reached the colonies consist of a few individuals living in a single small hole in the soil. This ant is peculiar to the great plains region of the United States, from Montana to Texas, New Mexico and Arizona. In these States it is seldom found below 5000 ft. elevation and flourishes best between 6000 and 8000 feet. Its nests are large; from 3 to 6 yards in diameter. In British Columbia the largest nests have a diameter of about 1 yard. No nests will be found in the Okanagan above 1500 feet elevation. It is a pugnacious ant, and its sting is remarkably severe, and the fiery, numbing pain which it produces may last for hours. Stores of grass seed and the seeds of **Lewisia rediviva** Pursh. were found in the nests of these ants at Osoyoos. It is a pale red ant 6 mm. in length.

Genus **Myrmica** Latreille

Myrmica mutica Emery.

The Canadian National collection contains specimens from Dog Lake near Penticton, collected by the late Dr. C. G. Hewitt and determined by Prof. W. M. Wheeler.

Myrmica rubra Linnaeus. subsp. **brevinodis** Emery. var. **frigida** Forel. Recorded from British Columbia by Prof. W. M. Wheeler.

Myrmica rubra Linnaeus subsp. **brevinodis** Emery var. **whymperi** Forel. Recorded from British Columbia by Prof. W. M. Wheeler.

Myrmica rubra Linnaeus. subsp. **brevinodis** Emery. var. **glacialis** Forel. Recorded from British Columbia by Prof. W. M. Wheeler.

Sub-family **Dolichoderinae**

Genus **Tapinoma** Forster

Tapinoma sessile Say.

A small dark-brown ant without the characteristic pedicil between the thorax and abdomen. Length 2.5 to 3 mm. When disturbed, this ant runs about with its abdomen raised and emits a strong odor of rancid cocoanuts, known as the "Tapinoma odor." It is a very common ant, nesting under stones, logs, and even small pieces of wood.

Sub-family **Camponotinae**

Genus **Lasius** Fabricius

Lasius niger Linnaeus var. **sitkaënsis** Pergande.

This is a small dark-brown ant about 2 mm. in length. The small earth craters made by these ants in excavating their nests beneath the soil are common objects on garden paths and on dry sandy soils. This is a destructive garden ant, which is said to hoard the eggs of the corn-root louse (Aphis maidiradicis) in its nest over winter and to distribute the newly-hatched young along the roots of the maize in the spring.

Lasius umbratus Nyl. n. subsp. Wheeler.

This is a rather sluggish, bright yellow ant; 4 to 5 mm. in length. It nests in moist locations under stones. It appears to be fairly common in the province.

Genus **Formica** Linnaeus

Formica sanguinea Latreille. subsp. **subintegra** Emery.

This is a medium-sized ant with head, thorax and legs reddish yellow and the abdomen brown. Length 5 to 6 mm. It is a slave-making species extending over the whole north temperate portion of the globe. When molested they fiercely attack the intruder, rushing at him with open mandibles. These ants raid the nests of other ants and steal the pupae and larvae, which they rear as slaves in their own nests. Nests of this species have been found at Oliver and Vaseaux Lake. In each case they were observed to be raiding a nearby nest of **Formica fusca** Linnaeus. var. **argentata** Wheeler.

Formica rufa Linnaeus subsp. **obscuripes** Forel.

This is one of the commonest of the British Columbia ants, and its large mound nest made of pieces of stick, pine needles, etc., are common objects, and well known to everyone. The head, thorax, and legs are reddish, and the abdomen is dark brown. The large mound nests of this ant are often particularly common under cottonwood trees, and the ants will be seen in thousands climbing the trees to get at the honey dew secreted by the aphis on the poplar leaves. At high elevations the colonies will be small and often located under stones instead of in mounds. When disturbed these ants rush wildly and fiercely about, and, throwing back their heads, sit up with the tip of their gasters directed forward and discharge volleys of formic acid in the direction whence they are threatened.

Formica rufa Linnaeus. subsp. **aggerans** Wheeler.

The Canadian National collection contains specimens from Dog Lake, near Penticton, collected by the late Dr. C. G. Hewitt, and determined by Prof. W. M. Wheeler.

Formica truncicola Nyl. subsp. **integra** Nyl.

The Canadian National collection contains specimens from Nicola, collected by the late Dr. C. G. Hewitt and determined by Prof. W. M. Wheeler.

Formica fusca Linnaeus. var. **argentata** Wheeler.

This is an extremely active, shiny black ant with rather long legs; about 5 mm. in length. It has been found nesting in rather small colonies under stones or in a hole excavated at the base of a grass plant. It does not appear to be very common.

Formica fusca Linnaeus var. **gelida** Wheeler.

In this ant the head and thorax are red, while the abdomen is black. It is 5 to 6 mm. in length. It nests under stones and is a rather sluggish ant.

Formica fusca Linnaeus var. **neodara** Emery.

The Canadian National collection contains specimens from Chilliwack, collected by the late Dr. C. G. Hewitt and determined by Prof. W. M. Wheeler.

Formica fusca Linnaeus var. **neorufibarbis** Emery.

The Canadian National collection contains specimens from Kelowna and Kaslo, collected by the late Dr. C. G. Hewitt and determined by Prof. W. M. Wheeler.

Formica fusca Linnaeus subsp. **pruinosa** Wheeler.

In this ant the antennae, thorax and legs are dark reddish brown, and the abdomen black. It is 3 to 4 mm. in length. This species nests under stones and has also been taken in association with an earth mound.

Formica subpolita Mayr. var. **camponoticeps** Wheeler.

This ant has two sizes of workers. It is a crater ant, making fair-sized, craters in sandy or silt soils. In a gravelly or wet soil it will live under stones. This ant was found to be doing considerable damage to young celery plants at Malakwa in 1924 by tunnelling around the roots and attending some aphids which were on the roots. This so loosened the soil about the roots that the young plants dried up and died. The head, thorax, and legs are red and the abdomen black.

Formica subpolita Mayr. var. **neogagates** Emery.

This is a small black ant with antennae and legs lighter in colouration. It is found commonly nesting under stones.

Formica whymperi Forel.

The Canadian National collection contains specimens from Emerald Lake, collected by Prof. W. M. Wheeler.

Formica hewitti Wheeler.

The Canadian National collection contains cotypes of this species, collected at Emerald Lake by the late Dr. C. G. Hewitt and named by Prof. W. M. Wheeler.

Genus **Camponotus** Mayr.

Camponotus levigatus F. Smith.

This is a large jet black wood-boring species. It is not very common, and is usually taken boring in fir logs at high elevations.

Camponotus maculatus Fabricius subsp. **vicinus** Mayr.

This is a large species with red thorax and legs and black head and abdomen. It is said to occur on every continent and on many islands and is very variable. There are three sizes of workers. This ant is very common under stones in forests, but does not seem to bore in timber as much as the two other species (**C. levigatus** and **herculeanus**).

Camponotus herculeanus Linnaeus var. **modoc** Wheeler.

This species bores in rotten logs and also in dry standing timber, usually at high elevations. It is a large ant, averaging 10 mm. in length; black, with a coating of long golden hairs on its abdomen.

Camponotus herculeanus Linnaeus var. **whymperi** Forel.

The Canadian National collection contains specimens from Arrowhead, collected by the late Dr. C. G. Hewitt and determined by Prof. W. M. Wheeler.

LIST OF MEMBERS

W. B. Anderson, 1225 Roslyn Road, Victoria.....General
C. Bannister, 1154 Robson St., Vancouver.....General
E. R. Buckell, Court House, Vernon, B. C.....Orthoptera
W. R. Buckell, Salmon Arm, B. C.....Lepidoptera
E. H. Blackmore, Post Office, Victoria.....Lepidoptera
G. E. W. Clarke, Court House, Vancouver.....General
G. O. Day, Duncan, V. I.....Lepidoptera
Prof. John Davidson, University of B. C., Vancouver.....General
A. A. Dennys, Court House, Vernon.....General
W. Downes, Parliament Bldgs., Victoria.....Hemiptera
J. W. Eastham, Court House, Vancouver.....General
D. G. Gillespie, Pi Kappa Phi, Corvallis, Ore.....General
C. B. Garrett, Cranbrook, B. C.....Diptera
R. Glendenning, Agassiz, B. C.....Aphididae
G. A. Hardy, Provincial Museum, Victoria.....Coleoptera
E. Hearle, Indian Head, Sask.....Culicidae
A. W. Hanham, Duncan, V. I.....Lepidoptera, Coleoptera
R. Hopping, Court House, Vernon.....Coleoptera
F. Kermode, Provincial Museum, Victoria.....General
W. H. Lyne, Court House, Vancouver.....General
L. E. Marmont, Maillardville, B. C.....Lepidoptera
W. H. A. Preece, Sidney, V. I.....Coleoptera
H. H. Ross, University of Illinois.....Tenthredinidae
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J. Stanley, University of Minnesota.....General
J. B. Thompson, R.M.D. No. 4, Victoria, B. C.....General
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J. W. Winson, Huntingdon, B. C.....General
A. R. Wootton, 975 Park St., Vancouver.....General